IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Jerrold V. Hauck, et al.
App. No.	:	10/728,185
Filed	:	December 3, 2003
For	:	**FLY-BY AND ACK-ACCELERATED ARBITRATION FOR BROADCAST PACKETS**
Examiner	:	Cehic, Kenan
Group Art Unit:		2473

Customer No. 65201

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April 29, 2011
(Date)

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AMENDMENT AFTER ALLOWANCE PURSUANT TO 37 C.F.R. §1.312

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to 37 C.F.R. §1.312 and prior to the payment of the issue fee, please amend the above-referenced application as follows:

IN THE CLAIMS

Please cancel Claims 23, 26, 27, 30, and 49, without prejudice, and add new Claims 50-86, as follows:

1. (Previously presented) A method for administering a serial bus, the bus facilitating communication between node devices connected to the bus and communicating over the bus in the form of packetized communication between said node devices, wherein a first type of packet comprises asynchronous packets characterized by the absence of a requirement that an unarbitrated response or ack packet be sent in response to transmission of a packet of the first type, wherein a second type of packet comprises asynchronous packets, the method comprising:

if there is a packet of the second type to be sent, then concatenating the packet of the second type to a plurality of packets of the first type and sending the plurality of packets of the first type followed by the concatenated packet of the second type; and

if there is no packet of the second type to be sent, then concatenating a bogus ack packet to the plurality of packets of the first type and sending the plurality of packets of the first type followed by the concatenated bogus ack packet.

2. (Original) The method of claim 1, wherein concatenating the packet of the second type is performed by link hardware.

3. (Original) The method of claim 1, wherein concatenation of the bogus ack packet is performed by link hardware.

4. (Original) The method of claim 1, wherein concatenation of the bogus ack packet is performed by PHY hardware.

5. (Original) The method of claim 4, wherein link hardware is unaware that the PHY hardware performs concatenation.

6. (Original) The method of claim 1, further comprising inspecting a first quadlet of a packet to determine a packet type.

7. (Original) The method of claim 6, wherein the first quadlet contains a transaction code, further comprising:

determining from the transaction code that the packet is a stream packet; and

determining that transmission is not occurring during an isochronous period.

8. – 17. (Cancelled)

18. (Previously presented) A method for administering a serial bus, the bus facilitating communication between node devices connected to the bus and communicating over the bus in the form of packetized communication between said node devices, wherein a first type of packet comprises asynchronous packets characterized by the absence of a requirement that an unarbitrated response or ack packet be sent in response to transmission of a packet of the first type, wherein a second type of packet comprises asynchronous packets, the method comprising:

receiving a packet of the first type;

determining that there are no packets of the second type to be sent;

if fly-by concatenation is permitted then concatenating a bogus ack packet to the received packet and sending the received packet and the bogus ack packet; and

if fly-by concatenation is not permitted then sending the received packet, arbitrating for the bus, and sending a bogus ack packet.

19. (Original) The method of claim 18, wherein concatenating the bogus ack packet is performed by PHY hardware.

20. (Original) The method of claim 18, wherein arbitrating for control of the bus is performed by PHY hardware.

21. (Original) The method of claim 18, further comprising inspecting a first quadlet of a packet to determine a packet type.

22. (Original) The method of claim 21, wherein the first quadlet contains a transaction code, further comprising:

determining from the transaction code that the packet is a stream packet; and

determining that transmission is not occurring during an isochronous period.

23. - 30. (Cancelled)

31. (Previously presented) A method for administering a data bus, the bus facilitating communication between node devices communicating over the bus using at least a first type and second type of asynchronous packet, the first type of packet not requiring that an acknowledgement packet be sent in response to transmission of such first type of packet, the method comprising:

if a packet of the second type needs to be sent, concatenating the packet of the second type to a plurality of packets of the first type and sending the plurality of packets of the first type followed by the concatenated packet of the second type; and

if no packet of the second type needs to be sent, concatenating a false acknowledgement packet to the plurality of packets of the first type and sending the plurality of packets of the first type followed by the concatenated false acknowledgement packet.

32. (Previously presented) The method of claim 31, wherein concatenating the packet of the second type is performed by link hardware.

33. (Previously presented) The method of claim 31, wherein concatenation of the false acknowledgement packet is performed by link hardware.

34. (Previously presented) The method of claim 31, wherein concatenation of the false acknowledgement packet is performed by PHY hardware.

35. (Previously presented) The method of claim 34, wherein link hardware is unaware that the PHY hardware performs concatenation.

36. (Previously presented) The method of claim 31, further comprising inspecting a first quadlet of a packet to determine a packet type.

37. (Previously presented) The method of claim 36, wherein the first quadlet contains a transaction code, further comprising:

determining from the transaction code that the packet is a stream packet; and

determining that transmission is not occurring during an isochronous period.

38. (Previously presented) A method for administering a data bus, the bus facilitating communication between node devices communicating over the bus using at least a first type of asynchronous packet and a second type of asynchronous packet, the first type of packet having no requirement that a response packet be sent in response to transmission thereof, the method comprising:

receiving a packet of the first type;

determining that there are no packets of the second type to be sent;

if concatenation is permitted, concatenating a false response packet to the received packet and sending the received packet and the false response packet; and

if concatenation is not permitted, sending the received packet, arbitrating for the bus, and sending a false response packet.

39. (Previously presented) The method of claim 38, wherein concatenating the false response packet is performed by PHY hardware.

40. (Previously presented) The method of claim 38, wherein arbitrating for control of the bus is performed by PHY hardware.

41. (Previously presented) The method of claim 38, further comprising inspecting a first quadlet of a packet to determine a packet type.

42. (Previously presented) The method of claim 41, wherein the first quadlet contains a transaction code, further comprising:

determining from the transaction code that the packet is a stream packet; and

determining that transmission is not occurring during an isochronous period.

43. (Previously presented) A node device adapted to administer a data bus, the bus facilitating communication between said node device and another device communicating over the bus using at least a first type and second type of asynchronous packet, the first type of packet not requiring that an acknowledgement packet be sent in response to transmission of such first type of packet, the node device comprising first apparatus adapted to:

determine if a packet of the second type needs to be sent, and if so, concatenate the packet of the second type to a plurality of packets of the first type, and send the plurality of packets of the first type followed by the concatenated packet of the second type; and

if no packet of the second type needs to be sent, concatenate a false acknowledgement packet to the plurality of packets of the first type, and send the plurality of packets of the first type followed by the concatenated false acknowledgement packet.

44. (Previously presented) The node device of claim 43, further comprising link hardware adapted to concatenate the packet of the second type.

45. (Previously presented) The node device of claim 43, further comprising link hardware adapted to concatenate the false acknowledgement packet.

46. (Previously presented) The node device of claim 43, further comprising PHY hardware adapted to concatenate the false acknowledgement packet.

47. (Previously presented) The node device of claim 43, further comprising apparatus adapted to inspect a first quadlet of a packet to determine a packet type, the first quadlet containing a transaction code.

48. (Previously presented) The node device of claim 47, further comprising apparatus adapted to:

determine from the transaction code that the packet is a stream packet; and

determine that transmission is not occurring during an isochronous period.

49. (Cancelled)

50. (New) A non-transitory computer readable medium containing instructions which, when executed by a computer, administer a serial bus that facilitates communication between node devices connected to the bus and communicating over the bus in the form of packetized communication between the node devices, wherein a first type of packet comprises asynchronous packets characterized by the absence of a requirement that an unarbitrated response or ack packet be sent in response to transmission of a packet of the first type, wherein a second type of packet comprises asynchronous packets, by performing the acts of:

if there is a packet of the second type to be sent, then concatenating the packet of the second type to a plurality of packets of the first type and sending the plurality of packets of the first type followed by the concatenated packet of the second type; and

if there is no packet of the second type to be sent, then concatenating a bogus ack packet to the plurality of packets of the first type and sending the plurality of packets of the first type followed by the concatenated bogus ack packet.

51. (New) The non-transitory computer readable medium of Claim 50, further comprising instructions which, when executed by a computer, instruct link hardware to perform concatenation of the packet of the second type.

52. (New) The non-transitory computer readable medium of Claim 50, further comprising instructions which, when executed by a computer, instruct link hardware to perform concatenation of the bogus ack packet.

53. (New) The non-transitory computer readable medium of Claim 50, further comprising instructions which, when executed by a computer, instruct PHY hardware to perform concatenation of the bogus ack packet.

54. (New) The non-transitory computer readable medium of Claim 53, further comprising instructions which, when executed by a computer, instruct link hardware to be unaware that PHY hardware performs concatenation.

55. (New) The non-transitory computer readable medium of Claim 50, further comprising instructions which, when executed by a computer, inspect a first quadlet of a packet to determine a packet type.

56. (New) The non-transitory computer readable medium of Claim 55, further comprising instructions which, when executed by a computer, determine from a transaction code of the first quadlet:

that the packet is a stream packet; and

that transmission is not occurring during an isochronous period.

57. (New) A non-transitory computer readable medium containing instructions which, when executed by a computer, administer a serial bus that facilitates communication between node devices connected to the bus and communicating over the bus in the form of packetized communication between the node devices, wherein a first type of packet comprises asynchronous packets characterized by the absence of a requirement that an unarbitrated response or ack packet be sent in response to transmission of a packet of the first type, wherein a second type of packet comprises asynchronous packets, by performing the acts of:

receiving a packet of the first type;

determining that there are no packets of the second type to be sent;

if fly-by concatenation is permitted then concatenating a bogus ack packet to the received packet and sending the received packet and the bogus ack packet; and

if fly-by concatenation is not permitted then sending the received packet, arbitrating for the bus, and sending a bogus ack packet.

58. (New) The non-transitory computer readable medium of Claim 57, further comprising instructions which, when executed by a computer, instruct link hardware to concatenate the packet of the second type.

59. (New) The non-transitory computer readable medium of Claim 57, further comprising instructions which, when executed by a computer, instruct link hardware to concatenate the bogus ack packet.

60. (New) The non-transitory computer readable medium of Claim 57, further comprising instructions which, when executed by a computer, instruct PHY hardware to concatenate the bogus ack packet.

61. (New) The non-transitory computer readable medium of Claim 60, further comprising instructions which, when executed by a computer, instruct link hardware to be unaware that PHY hardware performs concatenation.

62. (New) The non-transitory computer readable medium of Claim 57, further comprising instructions which, when executed by a computer, inspect a first quadlet of a packet to determine a packet type.

63. (New) The non-transitory computer readable medium of Claim 62, further comprising instructions which, when executed by a computer, determine from a transaction code of the first quadlet:

that the packet is a stream packet; and

that transmission is not occurring during an isochronous period.

64. (New) The non-transitory computer readable medium of Claim 57, further comprising instructions which, when executed by a computer, instruct PHY hardware to arbitrate for control of the bus.

65. (New) A node device connected to a serial bus, the node device comprising a non-transitory computer readable medium comprising instructions which, when executed by a computer, administer a serial bus that facilitates communication between the node device and a plurality of node devices connected to the bus and communicating over the bus in the form of packetized communication between the node device and the plurality of node devices, wherein a first type of packet comprises asynchronous packets characterized by the absence of a requirement that an unarbitrated response or ack packet be sent in response to transmission of a packet of the first type, wherein a second type of packet comprises asynchronous packets, by performing the acts of:

if there is a packet of the second type to be sent, then concatenating the packet of the second type to a plurality of packets of the first type and sending the plurality of packets of the first type followed by the concatenated packet of the second type; and

if there is no packet of the second type to be sent, then concatenating a bogus ack packet to the plurality of packets of the first type and sending the plurality of packets of the first type followed by the concatenated bogus ack packet.

66. (New) The node device of Claim 65, comprising link hardware configured to concatenate the packet of the second type.

67. (New) The node device of Claim 65, comprising link hardware configured to concatenate the bogus ack packet.

68. (New) The node device of Claim 65, comprising PHY hardware configured to concatenate the bogus ack packet.

69. (New) The node device of Claim 68, wherein the link hardware is unaware that PHY hardware performs concatenation.

70. (New) The node device of Claim 65, comprising a non-transitory computer readable medium, comprising instructions which, when executed by a computer, inspect a first quadlet of a packet to determine a packet type.

71. (New) The node device of Claim 70, wherein the non-transitory computer readable medium, further comprises instructions which, when executed by a computer, determine from a transaction code of the first quadlet:

that the packet is a stream packet; and

that transmission is not occurring during an isochronous period.

72. (New) A node device connected to a serial bus, the node device comprising a non-transitory computer readable medium comprising instructions which, when executed by a computer, administer a serial bus that facilitates communication between the node device and a plurality of node devices connected to the bus and communicating over the bus in the form of packetized communication between the node device and the plurality of node devices, wherein a first type of packet comprises asynchronous packets characterized by the absence of a requirement that an unarbitrated response or ack packet be sent in response to transmission of a

packet of the first type, wherein a second type of packet comprises asynchronous packets, by performing the acts of:

receiving a packet of the first type;

determining that there are no packets of the second type to be sent;

if fly-by concatenation is permitted then concatenating a bogus ack packet to the received packet and sending the received packet and the bogus ack packet; and

if fly-by concatenation is not permitted then sending the received packet, arbitrating for the bus, and sending a bogus ack packet.

73. (New) The node device of Claim 72, comprising link hardware configured to concatenate the packet of the second type.

74. (New) The node device of Claim 72, comprising link hardware configured to concatenate the bogus ack packet.

75. (New) The node device of Claim 72, comprising PHY hardware configured to concatenate the bogus ack packet.

76. (New) The node device of Claim 75, wherein the link hardware is unaware that PHY hardware performs concatenation.

77. (New) The node device of Claim 72, comprising a non-transitory computer readable medium, comprising instructions which, when executed by a computer, inspect a first quadlet of a packet to determine a packet type.

78. (New) The node device of Claim 77, wherein the non-transitory computer readable medium, further comprises instructions which, when executed by a computer, determine from a transaction code of the first quadlet:

that the packet is a stream packet; and

that transmission is not occurring during an isochronous period.

79. (New) The node device of Claim 72, comprising a non-transitory computer readable medium, comprising instructions which, when executed by a computer, instruct PHY hardware to arbitrate for control of the bus.

80. (New) A node device for administering a data bus, the bus facilitating communication between the node device and another device communicating over the bus using at least a first type of asynchronous packet and a second type of asynchronous packet, the first

type of packet having no requirement that a response packet be sent in response to transmission thereof, the node device comprising apparatus adapted to:

receive a packet of the first type;

determine that there are no packets of the second type to be sent;

if concatenation is permitted, concatenate a false response packet to the received packet, and send the received packet and the false response packet; and

if concatenation is not permitted, send the received packet, arbitrate for the bus, and send the false response packet.

81. (New) The node device of claim 80, further comprising link hardware adapted to concatenate the packet of the second type.

82. (New) The node device of claim 80, further comprising link hardware adapted to concatenate the false acknowledgement packet.

83. (New) The node device of claim 80, further comprising PHY hardware adapted to concatenate the false acknowledgement packet.

84. (New) The node device of claim 80, further comprising apparatus adapted to inspect a first quadlet of a packet to determine a packet type, the first quadlet containing a transaction code.

85. (New) The node device of claim 84, further comprising apparatus adapted to:

determine from the transaction code that the packet is a stream packet; and

determine that transmission is not occurring during an isochronous period.

86. (New) The node device of claim 80, further comprising PHY hardware adapted to arbitrate for control of the bus.

REMARKS

Claims 1-7, 18-23, 26-27, and 30-49 were pending in the application. By this paper, Applicant has cancelled Claims 23, 26, 27, 30, and 49, without prejudice, and added new Claims 50-86. Accordingly, Claims 1-7, 18-22, 31-48, and 50-86 are presented for examination.

Examiner's Amendment

Per the Examiner's Amendment in the Notice of Allowance and Fee(s) Due (hereinafter "Notice of Allowance"), Claim 38 now recites "*the false response packet*".

New Claims

Applicant has by this paper added new independent Claims 50, 57, 65, 72, and 80 which relate generally to the subject matter of cancelled Claims 23, 26, 27, 30, and 49, respectively. Pursuant to teleconference with the Examiner on April 29, 2011, new independent Claims 50, 57, 65, 72, and 80 are in condition for allowance.

Applicant has also, by this paper, added new dependent Claims 51-56, 58-64, 66-71, 73-79, and 81-86 which relate generally to the subject matter of Claims 2-7, and 40, which have been previously examined and allowed. Applicant respectfully submits that these dependent Claims 51-56, 58-64, 66-71, 73-79, and 81-86 are also in condition for allowance.

Applicant also respectfully submits that no new matter has been added by way of new Claims 50-86.

Other remarks -

Applicant is submitting this amendment prior to the payment of the issue fee, and requests that this amendment be entered at the earliest opportunity prior to the issuance of the patent.

Applicant hereby specifically reserves the right to prosecute claims of different scope in another continuation or divisional application.

Applicant notes that any claim cancellations or additions made herein are made solely for the purposes of more clearly and particularly describing and claiming the invention, and not for purposes of overcoming art or for patentability. The Examiner should infer no (i) adoption of a

position with respect to patentability, (ii) change in the Applicant's position with respect to any claim or subject matter of the invention, or (iii) acquiescence in any way to any position taken by the Examiner, based on such cancellations or additions.

If the Examiner has any questions or comments which may be resolved over the telephone, he is requested to call the undersigned at (858) 675-1670.

Respectfully submitted,

GAZDZINSKI & ASSOCIATES, PC

Dated: April 29, 2011

By: _____

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